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Patent

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re of Application of:

Daniel E. Grupp

Application No.: 09/612,607

Filing Date: July 7, 2000

For: ELECTRONSTATICALLY PERATED
TUNNELING TRANSISTOR

Examiner: Wille, Douglas A.

Art Group: 2814

Commissioner of Patents
Washington, D.C. 20231

TC 2800 MAIL ROOM

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RESPONSE TO FINAL OFFICE ACTION

Sir:

In response to the Office Action of December 6, 2001, careful reconsideration of this application is respectfully requested. The objections and rejections raised by the examiner in the Final Office Action reflect a basic and fundamental misunderstanding of the nature of the present invention. For example, the examiner rejects the present claims as being indefinite under 35 U.S.C. 112, second paragraph, because the island structure described in the claims is indicated as having "a non-uniform density of such energy states". It appears the examiner does not understand this phrase.

The rejection of the claims on this basis should be removed. At the outset, it should be noted that the parent application, 09/296,858, now US Patent 6,198,113, issued with claims having identical language. No objections to the use of this terminology were ever raised during prosecution of that application, therefore it appears the patent office has taken inconsistent positions on this matter. For at least this reason, the present rejections should be removed.

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Furthermore, the specification provides a clear and unambiguous description of the questioned claim terminology. For example, at page 9, line 17 et seq., an embodiment of a transistor configured in accordance with the present invention is described as including an island made of a material having a band gap. Importantly, at room temperature, the valence and conduction bands of the island behave as continuous energy bands. Thus, although the bands are separated, and the island may thus be described as having a non-uniform density of energy states, the bands themselves behave as continuous energy bands and not quantum states. The Examiner's attention is also invited to the discussion at page 13, line 16 et seq. of the specification where this concept of a non-uniform density of energy states is further explored. For all these reasons then, the claim terminology is neither vague nor ambiguous in light of the present disclosure and the objections to the claims under 35 U.S.C. 112, second paragraph, should be removed.

The above discussion also points out the reason why the claim rejections under 35 U.S.C. 102 in view of Luryi et al. are inappropriate. The Office Action tacitly admits that the device described by Luryi includes a quantum well. See, e.g., Office Action at page 3, paragraph 2. That is, the device described by Luryi relies upon the quantum nature of the well for its operating characteristics.

The Examiner then commits a fundamental error by first characterizing the presently claimed invention as being one which relies upon the use quantized energy levels, and then equates this with the principle of operation of the Luryi device. This is a mistake. As specifically recited in the claims, and as further explained above, the present invention relates to a device having a non-uniform density of energy states. That is, a device in which separated conduction and valiance bands behave as continuous, and not quantum, energy bands. This fundamental and important distinction between the present invention and the device described by Luryi has been overlooked (or at the very least, misunderstood) by the examination afforded to this application. The present claims make it clear that a non-uniform density of states is a

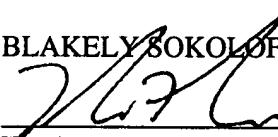
specific property of the island material, not one arising from geometrical structures in the device, as in a quantum well. The band structure of the device may look similar to that of Luryi's quantum well, but the origin of this structure is entirely different. It is earnestly requested, therefore, that the present claims be reconsidered and, upon such reconsideration, found patentable over all of the cited references.

If are any additional fees associated with this communication, please charge our Deposit Account No. 02-2666.

Respectfully submitted

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